

EPA Urban Heat Islands Webcast

November 12, 2008

Slide 1: Webcast Agenda

Neelam Patel: Hello, I'd like to welcome everyone to the EPA National Urban Heat Island webcast. My name is Neelam Patel, and I recently took over management of EPA's Urban Heat Island Program. In a few moments, Lauren, our contractor from ICF, will explain how to use the Live Meeting software that you have logged into. But before that, I'd like to quickly run through the webcast agenda for this afternoon. We're going to start off with some program updates that I will give on EPA's program, and then I will follow with a quick overview of the Transportation Research Board meeting that will be in January of '09 here in Washington, DC. After that we'll have Dr. Tony Brazel from Arizona State University giving an overview of the American Meteorological Society Urban Environment Symposium, which is also in January of '09, and that will be held in Phoenix, Arizona. Then we will have Yvonne Johnson from EPA describing our Office of Air Sustainable Skylines Initiative program. And lastly we'll have Jason Ching from EPA doing a presentation on advanced modeling tools and systems for addressing urban heat island mitigation requirements. And after his presentation, and the question and answer session that will follow, we'll have updates from all of the participants. After each section of the webcast, we will have an opportunity for questions and answers. You can, during each presentation, submit electronic questions which Lauren will go over with you in a moment. And then we'll also open up the phone lines for live questions that you came up with during the presentations. So, two ways to submit questions, and we're going to make sure we address all of them. I'd like to turn it over to Lauren to go over some of the Live Meeting Logistics.

Slide 2: Live Meeting Logistics

Lauren Pederson: Great, thanks Neelam. If everyone could please mute their phone lines by pressing *6 or use your own mute button on your phone to control background noise, that would be great. In order to speak during some of the question and answer sessions, please press *7 or again press the mute button on your phone. If you want to see the presentation full screen, you can just press F5, and you will just see the slides in the presentation that are given. This might help to eliminate any distractions with the Live Meeting Console. If you have a question, you will have an opportunity to ask it after each person presents, or there's a "Feedback" drop-down menu to indicate that, and I'll go through that on the following slide. If you're interested in seeing who else is participating on the webcast, you can also view an Attendee list, and I'll show this on the next slides as well. If you run into any problems throughout the webcast, please contact Nikhil Nadkarni, and there's his email address or phone number.

Slide 3: Feedback and Questions

Lauren Pederson: So for feedback and questions, there are color indicators on the "Feedback" drop-down. If you want the presenter to slow down, or if you have a question, you can change the color and indicate that – and that's shown here with the red circle.

Slide 4: Feedback and Questions

Lauren Pederson: Next, if you have a question, click on “Question and Answer” on the menu, and type it into the drop-down box. Click “Ask” to ask the question. And then, I will be asking after each presenter, and then we’ll open this up at the end if I can answer any remaining questions.

Slide 5: Attendees

Lauren Pederson: You can also see who else is participating in the webcast by looking at the Attendees list. So you can see where that is with the red circle here.

Slide 6: Handouts of Presentations

Lauren Pederson: And also, handouts are available for you to download. The handouts consist of all of the presentations in PDF format, as well as a couple of conference opportunities, which we’ll address during the webcast. Neelam, back to you.

Slide 7: EPA Urban Heat Island Program

Neelam Patel: So I am going to go over the Urban Heat Island Program – some of our program changes that we’ve had in the past few months; as well as go over our re-launched website with you guys; and lastly talk a little bit about our Urban Heat Island Compendium and its chapters. So to start off with program changes, I’d just like to introduce myself. I think most of you know my predecessor with the Urban Heat Island Program, Eva Wong. She recently left EPA and is now living in Uganda with her family. But she spent a lot of years on establishing this program and getting it to where it’s at. As for me, before taking over the Urban Heat Island Program, I worked at EPA for four years. In my new position I’m managing the Urban Heat Island Program and also working on climate change and energy issues at the local government level. Before taking this position I worked in EPA’s Office of Water, and spent some time working on regional climate and energy issues, and also working with territorial governments. So I look forward to moving the Heat Island Program forward. In the few months that I’ve been here I do see that communities are carefully and urgently thinking about how to adapt to climate and thinking about mitigation strategies. So with that, to respond to this activity, as I mentioned we do have the Urban Heat Island Compendium. Most of these chapters are available online, and I’ll talk a little bit more about the Compendium in a few minutes. Some of the other changes we have are going to be in the way we’re communicating. Earlier this summer we—instead of working from our personal emails—we’ve created a listserv to reach out to the heat island community. And, for the people that are on this call, if you aren’t already part of that listserv, please let me know (Neelam Patel) and we can get you on it. And if there are other people that would be interested, please let them know about the listserv. We’d love for more communities and people working on heat islands to be part of our listserv. And the last thing in terms of our program – we do have the regular webcasts. We generally tend to hold quarterly webcasts. If, for future webcasts, you have ideas for presentations, information on new tools, or successful programs that are addressing the heat island impacts, please keep those in mind and send those to us so we can plan to spread the word about those programs.

Slide 8: EPA Urban Heat Island Website

Neelam Patel: So starting with our re-launched website—the Urban Heat Island website—I just wanted to go over a little bit about the structure of the website. Basically our previous website was designed seven years ago, and so we decided to revise and restructure the website to provide more up-to-date information and increase the usability, and to address current concerns related to heat islands. So the website was designed to provide information on heat island issues and connect users to resources that we have at EPA, and also resources that are available in the larger heat island community. The website goes through the heat island effect, its impacts, and strategies that communities can take to reduce urban temperatures. So what we've done to organize the website is to break it up into a few main categories. The first one is “Basic Information”—it answers questions like: what is an urban heat island, why do we care about heat islands, and what you can do—which leads into the bulk of our Compendium, which is mitigation strategies. Another important section of the website is the “Where You Live” section, and this actually houses EPA's Urban Heat Island Community Actions Database. This is one of the key resources we provide to people interested in heat islands. The Database provides information on more than 75 local and state-wide initiatives to reduce heat islands, and also benefit from these activities in other ways. You can access into the database by focusing on location, mitigation strategy (so if you're looking to add some more trees and vegetation to your community), or by initiative type (which is city ordinances, building codes, or outreach programs). When you do get a chance to browse through the Community Actions Database, keep in mind that the actions listed are just some of them that are available out there to cool communities while saving energy and also improving air quality. So if you know of programs or initiatives that are not within our database, please let us know. Two of the other sections on the website are the “Heat Island Impacts” section, which explains how heat islands affect energy use, air quality, human health, and water quality; and then we have our “Heat Island Mitigation” section which is where, like I said, you can find a lot of the Compendium chapters, and this section focuses on how to address how communities can reduce temperatures through energy-saving strategies that provide multiple benefits. Some of the new features on our website include a calendar of related events and conferences, so please look for that, and again if you have things that we should add let us know, and we added a new featured webcast. And then, as I mentioned, some of our key EPA resources are on the website: the database; webcasts from recent years, as well as past years where we were using the conference call format; and then lastly, our Compendium.

Slide 9: EPA Urban Heat Island Compendium

Neelam Patel: So, coming to our Compendium, just to give you an idea, our Compendium is titled “Reducing Urban Heat Islands: Compendium of Strategies.” We designed the Compendium to provide the latest information to those interested in understanding and addressing heat island impacts. And what we want to do is answer the questions that we're being asked about heat islands in the current world of activity. We also focused on creating a bridge between the available scientific information and the programmatic people working on heat island impacts. So this will include city officials as well as state policy makers. And what the Compendium tries to do is it compiles scientific information and examples of how the latest

scientific information and technologies are actually being used. So, overall in the Compendium we strive to effectively provide mitigation strategies that are scientifically defensible—we've been really careful to make sure that the information has a scientific basis. The mitigation strategies also have sections discussing the overview of costs and benefits, and lastly we have references to examples as well as other resources. So the book is not a how-to guide, but we do want it to be a reference to answer key questions that you have as you develop your programs. So that covers all of the program changes that we had in the last few months, and updates with our exciting new resources.

Slide 10: TRB Subcommittee: Pavement Materials and the Urban Climate

Neelam Patel: The next thing I'd like to do is just quickly go over a meeting that's coming up. As I mentioned, most of the chapters of the Compendium are on the website in draft form, and are ready to use and [be] referred to (they've been peer reviewed). We're currently working on the peer review of the Pavements chapter. And with pavements the scientific information is still emerging—technologies are still emerging—and questions are still being answered. As part of addressing the question of pavements, I'd like to briefly go over the Transportation Research Board meeting that's coming up in January. A quick explanation of what the Transportation Research Board (TRB) is: TRB is one of the major divisions of the National Research Council, which is the principal operating agency for the National Academies of Science. They basically provide information to government, the public, and the scientific and engineering communities. So what Eva Wong and others, Kamil [Kaloush], at one of our universities that we work with—have created a subcommittee to look at pavement materials. The Subcommittee title is “Pavement Materials and the Urban Climate.” So during the TRB meeting, which is in January of '09—and the theme of this meeting is actually transportation, energy, and climate change—there's going to be three sessions that are related to the pavements subcommittee. The first session will have four papers presented on pavement technologies, and on the next slide you'll see the title of those papers and a little bit more information about the session itself. The second meeting related to pavements is the actually Subcommittee meeting: “Pavement Materials and the Urban Climate.” And the last session related to pavements is a paper session where several papers will be presented, titled “Climate Change and Design and Management of Sustainable Pavements.” And this session is being sponsored by several different subcommittees.

Slide 11: Pavement Materials and the Urban Climate Subcommittee Paper Presentation

Neelam Patel: So I do encourage, for those interested in those topics, to look into attending the TRB.

Slide 12: EPA Urban Heat Island Contact

Neelam Patel: And with that, I would like to open up to any questions that we may have received online, or if there's questions from any of the participants.

Lauren Pederson: We didn't receive any questions online.

Neelam Patel: And does anyone have any questions?

Slide 13: Information on Upcoming AMS Meeting

Neelam Patel: Okay, in that case, I would like to introduce our next speaker, Dr. Tony Brazel. Tony Brazel is currently an associate director of the School of Geographical Sciences and professor at Arizona State University. He is a team member on the Climate Science Team of the Decision Center for Desert City, a National Science Foundation project at Arizona State University. He is a co-planner on the Central Arizona-Phoenix Long-Term Ecological Research NSF project on urban ecology, the Center for Climate, Ecosystem Program areas. He is a former member of the Board on Urban Environments of the American Meteorological Society, and the Scholarship Committee of the International Association on Urban Climate. This afternoon, Dr. Brazel will be discussing the upcoming AMS meeting, so I'd like to turn it over to him.

Tony Brazel: Good afternoon everybody, I'm coming to you from sunny Phoenix, Arizona here. Just about two months from now, almost exactly, there'll be a National American Meteorological Society Meeting. And within that meeting is the Urban Symposium, which you'll see in the Powerpoint that I have here, it's mostly about that. One important thing on the first slide is my email, if there are any questions about this. The second thing on the first slide is the website of the AMS, in which you'll just go crazy exploring everything you want to know about the AMS and certainly about the upcoming conference.

Slide 14: The 89th Annual AMS Meeting will be held 11-15 January 2009 at the Phoenix Convention Center in Phoenix, Arizona

Tony Brazel: On the second slide it just lists typically what you find in a very large annual meeting. But I will point out to you that the title of this particular meeting is "Urban Weather and Climate: Now and the Future." So this particular annual meeting has an overall theme of urban weather and climate.

Slide 15: The Reason the Meeting is not in July

Tony Brazel: The third slide just shows the temperatures here in July, which is one reason we're meeting in January. But I would just point out too that here in Phoenix, we're working on making a pedestrian-friendly downtown and place to live, even in the summer. And actually some of the meeting is going to address papers on that issue.

Slide 16: Presidential Forum

Tony Brazel: The next slide just says that there is a Presidential Forum—it's on the first major day of the conference, which is Monday. The title is "The Quadruple Convergence of Urbanization, Population, Growth, Climate Change, and Coastalization – a Perfect Storm?" And here on this slide you can see the distinguished participants, the panel. There is also to be an electronic forum hotline—I show the site for that—and that will be set up to submit questions, much like we're doing in this webcast, in advance for the panel.

Slide 17: American Meteorological Society Board on the Urban Environment

Tony Brazel: The next slide simply shows the fact that there is a Board on the Urban Environment – this is a website link to the program, which will give you the details at this point of all the speakers, and the abstracts, and the sessions and when they are given, and so forth. So that’s what that particular slide is, and you can take a look at that website if you desire.

Slide 18: Eighth Symposium on the Urban Environment

Tony Brazel: The next slide is entitled “Eighth Symposium on the Urban Environment”—they had the seven previous symposiums in various locations. This is just a list of the program chairpersons—I was fortunate to part of that group to put together the program, and again if there’s any questions you might have, you can go back to that first slide using my email address.

Slide 19: T.R. Oke Symposium

Tony Brazel: The next slide indicates that there is a series of special symposiums, but one that particularly tugs the heart of the people in the urban community is called the T.R. Oke Symposium. I’m sure most of you have heard of Tim Oke, who is a research scientist in this area of urban climatology. There will be a symposium of that, and again you can get on the website and see the details of who is presenting and so forth. There is a special speaker, Gerald Mills, talking about Luke Howard (one of the first people to write about urban heat islands way back in 1833), Tim Oke, and the study of urban climates. And Gerald Mills has created a special volume now available on the website shown in this slide on Luke Howard and the climate of London.

Slide 20: The Timothy Oke Symposium, 12 January 2009

Tony Brazel: The next slide again is just a statement about honoring Dr. Oke and his contributions to urban meteorology and climatology. The symposium is on the 12th of January, all day.

Slide 21: Many Sessions

Tony Brazel: The next slide shows that there are, in the Urban Symposium itself, many sessions. I’ve listed them all here; I won’t bore you with going through each and every one. Again, you can find out who is presenting, and what the papers are, and who the authors are that you may want to contact, or eventually learn about.

Slide 22: Three Examples

Tony Brazel: And I’ve drawn out, by example, three particular sessions which treat public health, biometeorology, human comforts, sustainable urban design, and mitigation studies on the urban heat island. And I’ve put some details in the next couple of slides on these three sessions, which I won’t have time to go through, but you can take a look at that and find it on the AMS website.

Slide 23: Urban Heat Islands – Mitigation Studies

Tony Brazel: Here is just a list on the next slide of the mitigation papers, and there are a couple from Phoenix, again worrying how hot it is down here and what to do about it.

Slide 24: Urban Heat Islands – Mitigation Studies (continued)

Tony Brazel: And the next slide is just a spillover from that session's papers.

Slide 25: Sustainable Urban Design

Tony Brazel: The next couple of slides indicate the other two – sustainable urban design – and we have a featured speaker, Emily Talen, who is a certified planner. She happens to be in our university, and has much experience in reduction of urban sprawl and many issues that relate to urban climate.

Slide 26: Biometeorology and Public Health in Urban Areas

Tony Brazel: The last slide on biometeorology and public health—there's a number of distinguished people from around the world talking on various aspects of thermal comfort, mortality, and so on that relates to public health and human comfort in urban areas. There's also a series of poster sessions—again you discover all of these on the website—which highlight other really good papers at the conference. So that is kind of it in a nutshell. Again, if you have any further questions don't hesitate to email me, or just discover on your own using the AMS website, all about the upcoming meeting. I hope that any of you would like to come and are coming, it should be very good weather at least in January. Thank you.

Neelam Patel: Thank you. So I'll ask Lauren—did we get any questions on Dr. Brazel's presentation?

Lauren Pederson: No, not really about the presentation. One about downloading the Powerpoints—and once again, in the upper right-hand corner of your screen there is a button you can click that says "Handouts," and it will bring out PDFs of all of the presentations that are given today, so you can use that to download the presentations.

Neelam Patel: Thank you. So I would like to ask the audience if you have any questions on the meeting coming up? Okay—just a note on the meeting—Jason Ching, who is presenting shortly on modeling programs and tools will also be presenting at the AMS meeting in January.

Slide 27: Sustainable Skylines—National Initiative Launch Strategy

Neelam Patel: So, if there are no questions I'd like to introduce Yvonne Johnson, who is going to discuss EPA's Sustainable Skylines Program initiative. Yvonne presently works in EPA's Office of Air Quality, Planning and Standards, in the Communities and Tribal Programs Group. Yvonne has over 22 years of experience with EPA. She is an environmental protection specialist in OAQPS, the Office of Air Quality, Planning and Standards, and is the lead for the EPA Sustainable Skylines Initiative. This program helps areas promote effective collaboration among

community partners to implement projects and planning to improve sustainability, air quality, and quality of life. So Yvonne, we'll let you tell us more about that program.

Yvonne Johnson: Okay, great, thank you Neelam. Like Neelam said, we are launching a strategy called Sustainable Skylines.

Slide 28: What is Sustainable Skylines?

Yvonne Johnson: You're probably asking, what is Sustainable Skylines? It is a program designed to help cities reduce their emissions and promote sustainability with the goal of cleaner and healthier air. When we say cities we are not always talking about, *per se*, a city: it could be an area that is comprised of more than one city, it might be maybe a city and a rural area. So we really do not define what "city" is, and in many cases refer to it more as a project location. But again, it's designed to help areas reduce their emissions to promote sustainability.

Slide 29: Program Goals

Yvonne Johnson: Participants work in cooperation with EPA and its partners to increase community participation and to leverage resources. And we do this by essentially creating a framework to integrate transportation, energy, land use, and air quality planning. [From] the activities that are completed under the Sustainable Skylines Initiative, we like to see measurable air quality benefits within a three-year period. This doesn't mean that it has to be completed within that three-year period, but at least to be able to get the initial results within the first three years. We see this as an innovative program that is replicable to other areas. So there's different aspects—again, this is a framework—so what we see is that the different aspects of the framework can be used anywhere in the United States. It doesn't really matter whether you're on the East Coast, West Coast, it's going to be replicable. And, last of all, it provides the flexibility to meet the needs and priorities of individual areas. And this right here is really the most important part of the Sustainable Skylines Initiative. We want there to be as much flexibility as possible to meet the needs of a community, not only from an environmental standpoint but also from an economic and a social standpoint as well.

Slide 30: Program Objectives

Yvonne Johnson: The program objective is that it be place-based and locally driven. EPA's role is more like a coach, who comes to the table with a playbook, in that we work very closely with the project area to help them develop this locally driven initiative. We see it as a collaboration between multiple stakeholders both from a public and a private standpoint. And I'll talk in just a minute about our pilot city, but just to give you an example of what I'm talking about here: in Dallas, which was our very first pilot city, what has happened here is that we basically have helped them to initiate the Sustainable Skylines Initiative, and we provided them very little seed money to get started. The City of Dallas—their COG [the North Central Texas Council of Governments], their organizational committee, their EPA regional office, the EPA headquarters office, and many stakeholders from the community including private industry, have come to the table with resources to leverage this program. And it is gone from a very small project to an over \$4 million project. And when we say leverage from cities and partners, we're looking at not only

monetary dollars here, but also in-kind. Stakeholders and partners can come to the table and bring materials, technology, expertise, etc. Again, it's a very flexible initiative. And the most important part also is that it is a consensus-based project selection approach. So as the city moves forward with looking at the areas—and from the time to decide the activities to be put in place—it's all basically a consensus-based process. And the main thing is that there is community involvement, because for there to be real change, there has to be personal change in that, if you don't have the community involved, if they don't feel like they're involved, then they're not going to change.

Slide 31: National Project Categories

Yvonne Johnson: For any area that joins the Sustainable Skylines Initiative, we ask that they select at least one project in five of the following seven categories. Again, these are very broad categories. We help to provide information on various activities which could fall under these categories, but by no means do we ever come to the project location and say, “these are the activities you need to do.” And I will touch on the various project activities very quickly. Central city livability—this is essentially where the heat island effect would fall. And actually there is a fine line between some of these categories and activities, because some of these activities fall under more than one. For instance, you might be doing something that would fall under central city livability as well as energy/climate. But just to give you a couple of examples: central city livability could be your cooler surfaces, your roofs as well as your road surfaces, your more permeable surfaces; stationary area sources could be waste prevention or energy efficiency audits, particularly for the smaller businesses. We've done a lot of work with the auto body shops, and again that might be an area in one of your cities or communities—there seem to be a large number of auto body refinishing shops. Energy and climate—this could include everything from the management of the turf to watering. It could be a lot. Land use transportation strategies: this could be a decrease in vehicle miles traveled, an increase in public transportation, even something like a conversion of parking lots to parks. Diesel engines: examples could be anti-idling programs or equipment retrofits. Green buildings and developments: the city could be purchasing green materials or incorporating green building techniques into affordable housing. Again, going back to Dallas, they have an initiative where they are working very closely with Habitat for Humanity, and they're building green houses, and they have education programs for residents that will move into the energy-efficient homes. Off-road sources: this primarily deals with your small equipment, such as your lawn mowers, your lawn equipment, but really any off-road source. And examples could be some type of equipment replacement program for those types of sources.

Slide 32: Target Areas

Yvonne Johnson: And then what we also do is we provide tools to the user to help them determine what are the activities which would fit best with the project category. We work very closely with ICLEI, the Local Governments for Sustainability, in building a tool called “Climate Pollution Planning Assistance.” It's not completely finished yet, but hopefully will be out very soon, within the next few weeks or maybe month. But again, it's a situation where you can plug in some information, some criteria, where your focus lies; for example, energy employment, the size of your area, resource constraints. And then the database will provide you with some

information on various activities and how well these activities have gone, what their costs have been, etc. Target areas, the areas we're looking at—like I said before, it's not necessarily a city, it can be multiple cities or multiple areas. But we're looking at areas with a focus on local air quality concerns, particularly that have an opportunity for multi-media co-benefits; areas with air toxic concerns; areas which focus on climate change. The area does not necessarily have to be a non-attainment or near-non-attainment in regards to the EPA national air quality ambient rules. But we do ask that the city or areas be medium- to large-size communities. And the main reason here is so that you can tap into the corporate presence—again, going back to what I said earlier about bringing various stakeholders to the table, and then trying to leverage the initiative.

Slide 33: Lessons Learned

Yvonne Johnson: As I mentioned, we have two pilot projects underway. The first is Dallas, Texas, which was launched officially in March 2007. Our second pilot is in Kansas City in Kansas and Missouri, and again, this is a good example of where you have essentially more than one city. So you have two cities, you have multiple county governments, multiple state representatives involved, so again like I said, this has been a good learning project for us. But it was officially launched January 2008, and they're in the process now of finalizing all of the activities that they want to initiate. We are now in the process of expanding our national effort. And that is one of the reasons I come to you today—is to talk to you, to help you better understand what Sustainable Skylines is, but also to let you know that we are seeking applications for additional areas that might be interested in joining this initiative. Our very first national expansion project is in Philadelphia—it's just now getting off the ground, very early in the project. And like I said, we are now seeking applications from other interested parties.

Slide 34: Urban Heat Island/Stormwater Mitigation

Yvonne Johnson: What I'd like to do is just touch really briefly on what Dallas is doing with regard to trying to reduce the urban heat island effect. When Dallas went out and did a study, they determined that 23% of Dallas is covered with either asphalt or parking lots. So they knew that, combined with the climate in that area, they felt that they really needed to take an initiative to try to cool the surfaces. What they're doing is they are looking not only at cool surfaces for the roadways, but also for the roofs. The City of Dallas has also incorporated into some of their building codes information regarding the cooler roofs. They are looking at ways to reduce the stormwater runoff by using more permeable surfaces. They are also increasing the tree canopy for the area. And what they are doing is working closely with the USDA Forestry Service and their i-Tree model to try to determine: (1) what is the baseline, (2) what kind of trees can they plant. You don't want to create a problem by trying to correct a problem, so you don't want to plant trees that are going to need a lot of watering or maintenance throughout the year. So again, this is an example of where the Sustainable Skylines Initiative provides a framework of help, and a network of tools and expertise to help the community with those types of decision-making.

Slide 35: Parking Lots to Parks

Yvonne Johnson: In Kansas City, one of their projects is turning parking lots to parks to try to reduce the heat island effect. What they would like to do is, for any parking lots that are not

really being used, to just convert them to parks in general. But particularly if they cannot do that, they are trying to resurface them with a more permeable surface or trying to put more vegetation around those areas, so that you can reduce the amount of asphalt or concrete surface with the vegetation. But again, like I said, this is their plan, they're just now moving into this area.

Slide 36: Future Direction

Yvonne Johnson: In addition to this, Dallas and Kansas City have many other projects underway; I just wanted to highlight the ones which were specific to the heat island effect. But all of them work together—and just as an example, in Dallas they are trying to convert over 2,000 taxis to hybrid taxis; in Kansas City they are looking at an anti-idling program around all of their schools and hospitals, as well as working very closely with their builders and homeowner associations for the type of turf that is planted, again so it is the type that doesn't have to be watered a lot; and also the types of underground watering irrigation systems—so that, if it is raining outside, your irrigation system is not coming on, etc. So, again, the Sustainable Skylines Initiative is trying to look at the whole community. As I mentioned, the request for applications, the request for additional participants is posted at grants.gov. It closes December 17th of this year. We have a really quick turnaround where we will do a rating review process, and will have awards made by February 2009. One of the reasons is because we are also developing a Sustainable Skylines Workshop in Dallas, in March of 2009. And actually the dates will be March 9-11 at the Sheraton Dallas Hotel. This is a three-day workshop which is going to discuss the lessons learned from Dallas as well as highlighting the activities that they have underway; highlighting the tools that are available not only within EPA, but also other federal agencies and other areas; and then provide demonstrations. One of the demonstrations they are talking about is actually a company that is going to take a parking lot in Dallas and try to recycle the pavement there, and then resurface it with a more permeable surface. Again, this is all in the early planning, but it is just to give you an idea of what we're looking at for that workshop.

Slide 37: For More Information

Yvonne Johnson: If you have any questions, even at a later date, please feel free to contact me as well as visit our website, which is www.epa.gov/sustainableskylines. It will provide information on our pilot cities of Dallas and Kansas City as well.

Neelam Patel: Thank you Yvonne. Lauren, did we have any questions come in during Yvonne's talk?

Lauren Pederson: No, not for Yvonne.

Neelam Patel: Ok, great. Then I'd like to open it up: does anyone on the line have questions about the Sustainable Skylines Initiative or other questions that Yvonne would be able to answer?

Demetra McBride: Hi, this is Demetra McBride. Are there any particular approaches that Yvonne is finding effective in dealing with private landowners, particularly when you're talking

about the downtown core, where the property you're talking about is already spoken for in getting them on board, and to make these types of policy, or modeling or design adjustments?

Yvonne Johnson: Like I said, this is a new initiative. Most of our work has been done in Dallas. I haven't heard much about there being either a problem or just addressing that area specifically. Neelam, I don't know if you are going to have a follow-up for questions, because that might be something I need to talk with the Dallas folks specifically about, and then get back with you.

Neelam Patel: Yeah, I was actually just going to write your question down, and if you want to submit it as well that's fine. Because that is an interesting question for people that already have tried to develop policies to try to reduce heat island effects, if they've had resistance from—you're saying private landowners in central business districts?

Demetra McBride: Yes, we're going through an initiative right now where there is a movement to take out what little vegetation there is in the downtown core, and make it more hardscape. So I was just wondering, it's a design paradigm that is new for them, so I wondered if there was a particularly compelling argument that worked.

Neelam Patel: Well, I do know that in some cities—like for example, in the District of Columbia—there are city ordinances that are being passed to increase the amount of permeable pavement that is on properties for both public and private buildings. I believe, but I don't know in detail. But that might be something to refer the developers in your community to. The purpose behind the ordinance in Washington, DC, is to reduce stormwater runoff; it's actually not directly related to urban heat islands, but there is a possibility for co-benefits depending on the type of pavements that are used. So that would be one example. Any other questions?

Jason Ching: This is Jason Ching. I have a question regarding your extension to the national level, the program for Philadelphia. Would you describe that a little more in detail?

Yvonne Johnson: Well essentially Philadelphia—like I said, we had our pilots of Dallas and Kansas City, and Region 3 decided that they wanted to initiate a project in their region, so they did an open solicitation for any city in Region 3 which was interested, and Philadelphia was the area which was selected. So they are very early in the planning process, but I know that they are starting to put together their stakeholder committee. They are trying to formalize their stakeholders with some type of memorandum of understanding signature meeting so that that they can actually go ahead and begin to get pledges from stakeholders and move forward with the activity. They're not at the point where they have a list of specific activities ready to announce to the public yet, because again this isn't a set approach. So they have some ideas of what they want to work on, but they have to get that stakeholder group together and everybody needs to be able to buy into the activities. Does that answer your question?

Jason Ching: Yes, I'm just wondering if there will be a website of the activities—well, not just the activities, but the programs.

Yvonne Johnson: Yes there will be. If you go to the www.epa.gov/sustainableskylines website in the "Where You Live" section, there will be a map of the United States, and as we bring more

Sustainable Skylines project areas on board you will be able to click to those specific websites. Right now you'll be able to reach Kansas City and Dallas, and very soon, probably within the next few weeks we will have the link to the Philadelphia project ready.

Neelam Patel: And just to add on to what Yvonne said: the City of Dallas has a website on their Sustainable Skylines program that goes through all of their category process. So, any other questions for Yvonne on Sustainable Skylines?

Lauren Pederson: There is one question that came in online. What pollution reduction developments has Dallas implemented to mitigate its heat island, and how does that approach rank in terms of the effectiveness of different strategies to address heat islands?

Neelam Patel: So specifically asking what Dallas has done to reduce heat islands, and the co-benefits to pollution reduction? Yvonne has some information on the Dallas Central Livability program.

Yvonne Johnson: Like I said, one of the things that Dallas is specifically looking at is increasing their tree canopy and vegetation in the area. They have a multi-million dollar project where they are trying to add more trees in the area to help reduce the overall temperature. The other thing that they are working on is trying to reduce the amount of surface. And like I said, they did a study—over 23% of the Dallas area is covered in either asphalt or concrete—and so what they want to do is work with the public as well as the private owners of those parking lots and just the surfaces in general to resurface those with a cooler type of surface. As far as any benchmarks or any measurements that they have, at this point I don't have that specific information. That might be something we want to address. But like I said, the main areas they are looking at is the cooler road surfaces and the cooler roof surfaces, which like I said they have already incorporated that into their city-wide building codes, and then the increased vegetation.

Neelam Patel: Okay, thank you. What I'd like to do now is move on to our next presentation. If you have additional questions for Yvonne, we can always revisit Sustainable Skylines during the participant updates.

Slide 38: Investigation to Mitigate Heat Island Intensity using Models and the National Urban Database and Access Portal Tools (NUDAPT)

Neelam Patel: I'd like to now introduce Jason Ching from EPA's Office of Research and Development, and he will be doing his presentation on some modeling tools and systems that can address urban heat islands. Jason Ching is a meteorologist and has been with EPA for the past 33 years. Initially he was involved with urban and regional air quality and acid precipitation studies. But in 1990, he initiated and was responsible for the development of the initial version of EPA's CMAQ, the Community Multiscale Air Quality modeling system. He is currently involved in developing advanced meteorological and air quality modeling tools and support systems, and fine-scale modeling methods designed to address current and future urban air quality issues. And with that, let's turn it over to Jason for his presentation.

Jason Ching: Thank you very much. I appreciate being on this webcast. My topic is on modeling tools as it might relate to mitigating heat islands intensities, and with the models, and also the National Urban Database and Access Portal Tools, a project called NUDAPT.

Slide 39: Presentation Roadmap

Jason Ching: I'll cover my topic in the following ways: I'll introduce the issue, and then bring us to the point where we are on the state of the science of urban meteorology and air quality modeling. I'll talk about NUDAPT a bit, and then provide an example from collaborations that we have had in NUDAPT on mitigation strategies, and end with some discussion of the future.

Slide 40: UHI Problem Statement

Jason Ching: So the problem statement as far as I can see is that heat islands are complex, and they're in response to urbanization and population growth. And when that happens, air quality is reduced and exposures are exacerbated either directly or indirectly with the heat island. And if you were to turn the problem around, you can reduce the heat island and can also get a benefit in reducing air quality problems; for example, ozone.

Slide 41: Approaches to Mitigating UHI

Jason Ching: Approaches to mitigating urban heat islands—now this is a community I am speaking to that is well-versed in this—so from my understanding basically we try to do this by partitioning the surface energy budget, or making your transportation sector more efficient, or finding ways to decrease energy consumption. There are now advances I think in models and data from about a decade ago, and I think these are advances that would be very useful as planning tools as we get to specific details—which I've heard already discussed today—in mitigating the heat island. So we'll talk about that in the rest of the presentation.

Slide 42: Modeling

Jason Ching: Let me turn now to modeling. I've claimed that there've been some advances, and they really have occurred in the last ten years maybe. And these advances with systems available to us – the Meso-scale Meteorological Model stayed at NCAR; the WRF model, which is the predecessor to MM5, the Weather Research and Forecasting model that brings together the applied and the research community. Again the WRF research is being supported by NCAR, the National Center for Atmospheric Research. In EPA, in an effort to advance dispersion modeling, that has come about in a model called AERMOD. And as you heard, I was involved with the development of the CMAQ modeling system.

Slide 43: Challenge for meso-to-urban scale modeling

Jason Ching: So what we have done in these last ten years is to try to bring our modeling to a focus on the details that we find in urban areas. In the past, we have [had trouble trying] to characterize the urban area, and we do classify it according to land use. But now we are able to remedy this deficiency or limitation with more details.

Slide 44: Models need and can now account for different scales & variations in types, composition of urban land features

Jason Ching: And this is now going to be a schematic. When we deal with trying to improve models, we first of all try to recognize that urban areas are unique: they differ between European, Asian, and U.S. cities. But typically they are configured with buildings and suburban areas; they are treed or not treed; paved, and so forth; they have different structures to their street canyons. They create perturbations to the flow, the meteorology, in terms of creating a boundary layer with a lot of structure to them. So we want to ensure that modeling tools can distinguish these unique features.

Slide 45: Introducing drag concepts to relating meso-urban and building scale features

Jason Ching: Here is a picture—this is downtown Houston—a digitized map of buildings in this 1-kilometer square area of Houston. And you can see that it's made up of buildings of all sorts of size, shape, and aerial coverage, and that these will impact the whole of the meteorology, not just the temperature field, but also the momentum—the wind field—as well.

Slide 46: High resolution morphological urban data can be derived from lidar mapping and photogrammetric techniques

Jason Ching: So as we proceed with trying to develop these modeling tools at a finer resolution, we find that data is required—data that allows us to recognize that individual cities are unique. Data now is being collected, and I guess because of 9-11, the information is being speeded up to get most of the cities in the U.S. into a database with one- to five-meter resolution.

Slide 47: LIDAR Profiling to obtain building and vegetation data

Jason Ching: We can get this kind of data either through photogrammetric methodologies or by using airborne methods with systems called LIDAR. Basically what happens here is that the aircraft will fly over a city in transects and emit light and the return signal is recorded. And the ground, by way of a return signal, and obstacles, by way of their return signals – you subtract the two signals and you will get the definition of the obstacle—in this case here, a tree, or in urban area, buildings and so forth. And it can be done with existing technologies to give you 1-5 meter resolution at this point in time.

Slide 48: Introducing canopy features into MM5

Jason Ching: We take this kind of data, we take theoretical formulations that recognize these features, and then craft the model to handle this information. But we do it in an official way, and I'd like to go through that a little bit. Typically in a roughness approach, mentioned earlier, you don't have details picked out or captured other than through some kind of roughness or information about the materials or so forth, as related to its land use. In these more current approaches, we introduce either canopy layers to capture the information better, or a single layer that tries to capture the features. And this is what we have done, in a conceptual way, in MM5.

Slide 49: Implementation of canopy concepts and urban morphology parameters for improved modeling

Jason Ching: Now when you take a gander at a city, you note that it is made up of a lot of distribution of buildings and trees. And if you try to aggregate this—as I showed you in Houston, this one kilometer area, and generalize it to the whole area—you will composite that information into what the models can use. Parameters such as roof area density (the tops of the roofs, which might be wide here, or narrow here), the building plan area density, the frontal area density (the front of the building facing the wind), and a couple ones for vegetation—so these are height-dependent parameters.

Slide 50: Selected Urban Canopy Parameters per 1 km² cells for Harris County, TX

Jason Ching: Here is a modeling domain for Harris County—and this is Houston, in Harris County. And you see these 1-kilometer cells that we did in the model—and each of these cells contains what I call urban canopy parameters. And we set these parameters, such as plan area density of the building, the frontal area index, and so forth. So each particular grid would have its own set of parameters, and I'll show you a list of those parameters and run the model in a moment.

Slide 51: NUDAPT: strategic tool kit for advanced urban model implementation and applications

Jason Ching: Now let me switch gears from the modeling that is now in place, to the database that can support such models. We've been working with the AMS (American Meteorological Society) and the Office of the Federal Coordinator for Meteorology. And earlier on in this decade they really tried to encourage moving forward with implementation of new models and databases. EPA supported our proposal to develop a prototype of a database that would, in principle, be a facility for the nation and beyond. And this first venture is the NUDAPT: it's a two-year project that EPA sponsored, and it could not have been made successful without a lot of contributions from collaborators.

Slide 52: NUDAPT supports more robust model applications

Jason Ching: We're going to talk about urban heat island intensity applications, based upon modeling and on the NUDAPT prototype. So here's some background on NUDAPT. In this two-year effort, we've conducted model sensitivity studies, and what it has shown is that significant responses to the meteorology do occur when you can introduce data into the characterization of the urban surfaces and models, even to the point where we can address urban heat island mitigation concerns. NUDAPT, we know now, can be adapted to handle MM5 applications and WRF applications, and we even had collaborators from Canada and other government agencies that were interested. We've added, for custom applications, information on population and anthropogenic heating, which I think is very relevant for urban heat island intensity studies.

Slide 53: Prototype Implementation – The NUDAPT Framework

Jason Ching: In the prototype implementation, we're focusing clearly on urban modeling. In the prototype implementation we were adopting a community modeling system paradigm: what this means is we are taking advantage of portal technology. And if you ask me a question about it, I can go into more detail about it, but let me go on to say that this database has the ability—for the 133 cities that are legislated to have data collection—to have a complete set of the parameterizations needed for the advanced model that are urbanized at urban grid scales. It will have the ancillary data. The portal of the system is able to take our base data and re-grid them for others to use a customized approach. And it can also be used to change the map projections, which is a big deal. But it is able to take the gridded data we have generated and put it into different projection systems, and we've used Houston as our developmental prototype.

Slide 54: UCPs in NUDAPT (& growing)

Jason Ching: I mentioned that each grid that was shown earlier in the model will contain parameterizations. And these are a list of the parameters that are now in MM5 and in WRF. In the case of WRF, it is a single layer model that represents all of the urbanization. And MM5 is a multi-layer model. I should mention that WRF is now being implemented with a multi-layer model, much as in MM5, as we speak.

Slide 55: Gridded Anthropogenic Heating

Jason Ching: I indicated that anthropogenic heating data was included in NUDAPT, and here is a slide that displays the heating gridded at 1 kilometer. In this case here, it is an example of August, the 20th hour of that month—it's just the average for the whole month. We would have hourly-specific, day-specific information for each grid. Here is, for example, the time signature on an hourly basis for the heating per grid.

Slide 56: Sensitivity Study based on WRF-Noah UCM Temperature differences

Jason Ching: In one of the sensitivity studies, we have been able to look at the role of the heating data from NUDAPT, contrasting that with the default standard table lookup. And here in WRF, the sensitivity of using the NUDAPT-type data is shown here. Differences on the order of one degree can show up.

Slide 57: 250m Gridded Population for Central Houston, Texas

Jason Ching: I mentioned that population information was an important thing to have—in my mind—in NUDAPT for applications of exposure assessments, or homeland security issues, or whatever. We've had a wonderful collaboration from the Los Alamos National Laboratory, and they provided us gridded fields of daytime population as well as nighttime population. You will remember that nighttime population is the data you get from the Census. Daytime population is where people actually reside or work or go to school. In this case it is all the worker population.

Slide 58: Population

Jason Ching: Los Alamos has been very gracious and generous in providing to NUDAPT a database for the entire nation at 250 meter resolution of the gridded data and nighttime population, so that's part of NUDAPT.

Slide 59: Custom Collaborations

Jason Ching: The collaborations that we have had in these past two years have been primarily focused on MM5 and WRF, but we've had collaborators also involved with other meteorological systems. The data—we now have about 40 cities of the 130 cities that we've collected, and we're collecting more from the National Geospatial Agency. We have the gridded parameterized fields, what we call UCPs, for Houston. And in Arizona, Arizona State has developed customized UCPs for Phoenix. And there is Haider Taha for Sacramento, and I believe Haider is on this webcast. The day-night population and the anthropogenic heat is available—the heat rate is for Houston, and of course you saw the ones at the national level. While we have the prototype in Houston, we have collaborations and different levels of effort in Phoenix, Atlanta, and possibly a European megacity.

Slide 60: Urban Heat Island Mitigation Study

Jason Ching: So how about the urban heat island. Well this next set of slides does come from Haider Taha, and Haider, you might want to help me out if I don't do justice to these slides. When mitigating heat islands, we'll get the benefit of reduced cooling energy required, and subsequently we reduce the emissions generated from power plants. By reducing emissions—such as NO_x, VOC, CO₂—from anthropogenic sources, it also reduces some of the sources in a biogenic way. These reductions or cooling effects slow down the photochemical production of air pollutants, and they improve the air quality, mitigating the heat island of course, and reduce the pollution, and reduce mortality. The urban heat island does impact the meteorology and convective precipitation that can occur with additional heat and moisture that is produced in the city. So again, at this point, how might we use the tools that we are talking about? By increasing the albedo, by increasing the canopy coverage, by decreasing the anthropogenic heat flux, by greening the city, changing thermal properties, changing the degree of imperviousness, seeing the effects of air on the moisture and the runoff—these are effects that can be dealt with.

Slide 61: Examples of uMM5 applications

Jason Ching: Again, back to the collaboration. Here you see Haider Taha is providing the experience on the subject. He's done the work in the Houston area, and he's also performed studies of the sort in the Sacramento, California area.

Slide 62: Simulating UHI and mitigation potential (cooling) of the air and at the surface as a result of increased urban albedo

Jason Ching: In the study for Sacramento, let me go through this in a little bit of detail. It's a nested domain—a mix of the version of MM5—it's his customized version. He's taken MM5 from 12 kilometers to 4 kilometers to the domain for Sacramento, in which this simulation was done at 1 kilometer using the night system. And here, you see the wind field as well as the

temperature difference for simulated temperature changes resulting from urban albedo changes. And, if you look on the right-hand side of this, this inset shows you one of the many fields that are urban canopy parameter fields used in this urbanized MM5. Now if you take any one of these grids—in this particular case, Haider has selected the point here in the red circle—to look at the time signature over some 4 days or so, what happens when you change the albedo or the canopy (the vegetation, etc.) by a certain amount? And when you apply them individually, you come up with the resultant heat island or change in the temperature from a base case. Again here, only at this red dot, it's his time signature. And so if he changed the canopy, the vegetation materials, you will get this kind of response from the model in red. If you change the reflectance, or what's called albedo, you get this change shown in blue. And of course if you do a combination, you'll amplify both signals. So this is what can be done; in this case here, I think the simulation was done for flat-out change in albedo, percentage-wise, or in the canopy. You're permitted to do this, you're allowed to do this, you can exercise the model in any way wish, by changing the composition of the albedo and the canopy grid by grid. So there's a lot of flexibility you're allowed in these models.

Slide 63: Simulating changes in ozone to UHI reduction scenarios

Jason Ching: And Haider has taken results of the temperature changes that he can achieve into an air quality simulation. And in this case here, you have a 4 kilometer grid domain providing information, a nested domain here, for Sacramento. And here is the base-case air quality simulation for ozone shown here. Downtown Sacramento here—this is a domain for Sacramento being simulated at 1 kilometer. If you apply the urban heat island mitigation strategy, this is the kind of air quality improvement you can achieve in this kind of simulation. In here, downtown Sacramento seems to appear to have anywhere from 1-10 mitigation for ozone, so that's a benefit you can get from using this type of tool.

Slide 64: CMAQ (1 km grid model ozone in Houston, 2100 GMT)

Jason Ching: To return back to Houston, this is a simulation with MM5 and with CMAQ. CMAQ driven by MM5, without NUDAPT. When you look at NUDAPT, you get this simulation of CMAQ, and if you take the difference—while we cannot at any point evaluate the magnitude of the difference in the structure, you can see that there are significant differences if you were to bring on board NUDAPT into these advanced systems.

Slide 65: Overall summary NUDAPT provides

Jason Ching: So, in summary, specifically NUDAPT, it's my impression that it was a very successful venture. It is a platform that we have demonstrated can accommodate new modeling systems, new sets of parameterizations. We've demonstrated that it can be used for urban heat island modeling guidance. The community framework—more and more I think that a lot of us are feeling a lot more comfortable with the idea of community—this was built, the community concept was a basic part of the framework. It is urban focused. We have tools in the system which we can't talk about today, but we can certainly do regridding and remapping, which will be very helpful. Prototypes: we've got the prototypes here for urban heat islands, as we've demonstrated in Houston and Sacramento. What it means is that if it can be demonstrated in

these cities, it can be demonstrated or used in any other city as well. The data—cities do change, and NUDAPT can certainly accommodate changes in the data.

Slide 66: Suggestions, Options, Levels of Collaboration

Jason Ching: I'd like to promote the idea of collaboration, because I think that advancing models and methodologies becomes possible with a collaboration among modelers. Among those that are involved with a policy or applications, that's also possible. We'd love to see additional data become available to NUDAPT, and therefore then to the community. We're looking to see moving to a NUDAPT that could be a community decision support system with the idea of performing heat island mitigation analyses as a focus possibly, either within the NUDAPT system or as a collection of systems.

Slide 67: Final Remarks

Jason Ching: So again I want to say that in my opinion, this was a highly successful prototypic development. It is ongoing—by that I am saying that we have funding that allowed us to continue this development just for one more year. After the end of FY '09, we're going to have to find other means to support NUDAPT. Currently, for fiscal year '09, the system is at the University of North Carolina at the Institute for the Environment, in the section called CMAS. I'm exploring having NCAR (the National Center for Atmospheric Research) host NUDAPT as a permanent facility. They are receptive to the idea, so that discussion will continue. It makes sense because NCAR is the developer and supporter of the research version of WRF. So stay tuned for any further developments on that. The NUDAPT is flexible, and it is powerful. But there is going to be a journal article; in the Bulletin of the AMS that describes the system briefly. But I think the point is that it's got the power in the modeling database to stress urban heat island mitigation strategies; it's based on science that is improving, and getting better all the time. And so my last point is I encourage collaboration in the development or enhancing of this set of tools.

Slide 68: NUDAPT Collaborators

Jason Ching: And I guess I do have a last slide which shows the list of collaborators that helped make this two-year prototype a success.

Slide 69: Thank you for your time and interest. Questions?

Jason Ching: Ok, that's the end of my presentation.

Neelam Patel: Thank you Jason. Do we have any questions for Jason on the prototype and the tools?

Lauren Pederson: There was one question that came in. Please briefly review again the various potentials for collaboration and how one might get involved?

Jason Ching: The portal does allow for specific collaborations. In the portal we set aside rooms, and groups who would like to collaborate can contact me, and we can set up a special room

specifically for that collaboration. It could be an applications collaboration, it could be a model evaluation collaboration, it can be a whole host of possible activities. It's a room dedicated to those who are going to be the collaborators: they can share what they're doing through the Web, they can use a tool to help them facilitate collaborations. We really don't have a whole lot of experience to make this happen, other than our Houston study, but we do know that such a mechanism within the portal does facilitate collaboration. So I guess maybe that's a short answer to that question.

Neelam Patel: Thank you Jason. Are there any other questions for Jason on the application of this prototype? Okay, well then I'd like to open up the conversation to participant updates. I know that there were some upcoming meetings that people wanted to mention. Or if there are any other questions on the Sustainable Skylines Initiative, or any other programs that we've mentioned?

Slide 70: International Association for Urban Climate

Mel Pomeranz: Yes, Neelam, if I may. This is Mel Pomeranz of the Lawrence Berkeley National Lab, and I wanted to bring to the attention of the participants an international conference on urban heat islands. It's called the Second International Conference on Countermeasures to Urban Heat Islands. You very kindly put it on the EPA Resources calendar, but it is way down at the bottom because it's in September of 2009, when it will actually take place in Berkeley near our lab. But I wanted the participants of this webcast to be reminded of it. In fact, we're going to extend the deadline for applications or abstracts—we originally thought it would be November 15, but since this webcast is so close to that date, we are happy to extend the deadline of abstracts to December 1. And much of the work we heard about today would be excellent at that meeting. People are going to be coming from all over the world to present their work, and some of this sounds just perfect for our meeting. So I would encourage people to take a look at our website, it's <http://heatisland2009.lbl.gov/>, where you can get more information, and a general outline of the meeting, and the kind of topics we're going to cover, which are very similar to what we've heard today. Thank you very much for the opportunity to mention that and remind people about our meeting, which should be very exciting.

Neelam Patel: Thank you Melvin, and also, in the handouts section we've included a brochure about the conference. You can download that for more information. I just want to make a quick distinction. On your screen you may see a slide about another international conference on urban climate; that is a different than what Melvin just described. Melvin's conference is in September of '09 in Berkeley, California. And if we have Dr. Brazel still on the line?

Dr. Tony Brazel: I guess you have the first slide up there—there are two things. One is the meeting, which is the second slide. But the first one shows that there is a newsletter that people can, if you haven't gotten a chance—get on that website <http://www.urban-climate.org>, and you get to a newsletter of this organization, which contains what you see on that first slide: upcoming conferences, articles, student information and opportunities, reviews of various climate work around the world in different locations.

Slide 71: Call for Papers: The 7th International Conference on Urban Climate (ICUC-7)

Dr. Tony Brazel: And the second slide gives you details of this meeting: before the LBL meeting in September, you can go to Yokohama in June and July, and attend this international conference on urban climate. And there are several links there on the second slide that you can take a look at if you would like to attend that. Abstracts for the meeting are due December 15th. Thank you.

Neelam Patel: Thank you Dr. Brazel. Are there any other announcements or updates that people would like to share? Okay, well in that case, I would like to thank everyone for joining us for the Urban Heat Island webcast. And again, I encourage you to contact me, Neelam Patel, with any ideas or presentations for future webcasts. And again, I thank you for joining us.

Demetra McBride: Neelam, is it too late—I had a question? This is Demetra McBride again. For Dr. Brazel: are there any other prominent health impacts other than heat-related stress impacts and cardiopulmonary related impacts to human beings from urban heat island effects?

Dr. Tony Brazel: Wow, big question. I think the answer is yes. And I think there might be information at that AMS meeting if you look through the whole list of papers related to different aspects of health. There's disease vectors and all kinds of things that urban areas might affect. I know here in Phoenix we're worried about asthma and valley fever, and how the urban area distribution of land cover and climate relates to all of that down here in the Southwest. I'm sure that other people can speak better to that than me for what's going on in the rest of the world.

Mel Pomeranz: If I could make a comment—this is Mel Pomeranz again—someone actually did a very interesting highlight study of air pollution and how that can affect land values, like smog and visibility, things like that. That's another thing that—well, I don't know if I should talk about it, with the mortgage crisis as it is. Nonetheless, air pollution can actually affect people's views and the value of their property—another side issue; actually it was numerical values that have been estimated in the past.

Neelam Patel: Thank you Melvin for describing those studies to us. I just wanted to respond to Demetra's earlier question about how to deal with resistance by private landowners in addressing their landscapes, making them hardscaped. Demetra, I also wanted to refer you to the Urban Heat Island Community Actions Database that has information on projects. You might find some resources there. And also on EPA's Clean Energy Local Government website, there's a database that may have additional information for you as well.

Demetra McBride: Excellent, thank you. We were trying to avoid regulation, and that was the only thing.

Neelam Patel: And I think, just in terms of convincing those corporations, it may be helpful to point out that these things are being instituted because there are benefits.

Demetra McBride: Great, thank you again.

Neelam Patel: Any other questions from any other participants?

Jason Ching: I wanted to ask if Haider had any comments on the use of the tools that I talked about, relative to the heat island demonstration. I don't know if Haider is still on the line?

Neelam Patel: I don't think he is. With that being said, we are running over, it is 3:45. So I do want to thank everyone again for participating in the webcast. And our next one will be coming up in the Spring—late Winter/early Spring—so we can connect that, and of course we have our Urban Heat Island Listserv as well.